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Maritimes Region

Canadian Science Advisory Secretariat
Science Response 2016/037

2015 STOCK STATUS UPDATE OF LOBSTER (*HOMARUS AMERICANUS*) OFF SOUTHWEST NOVA SCOTIA (LOBSTER FISHING AREA 34)

Context

Advice on the stock status of lobster in lobster fishing area (LFA) 34 is requested annually by Fisheries and Aquaculture Management (FAM). The last Regional Advisory Process of this stock occurred in February 2013 (DFO 2013, Tremblay et al. 2013), with updates occurring in 2014 and 2015 (DFO 2015). The 2013 assessment identified three key indicators that describe changes in lobster abundance or biomass as well as proposing reference levels for each indicator. This Science Response updates these indicators to the end of the 2014-2015 fishing season.

This Science Response Report results from the Science Response Process on May 25, 2016, on the Stock Status Update of American Lobster in Lobster Fishing Area (LFA) 34.

Background

Commercial lobster fishing in LFA 34 (Figure 1), off Southwest Nova Scotia, currently has the highest landings and the most participants of any LFA in Canada. Landings in LFA 34 began a long-term increase in the 1980s and recent landings are near record highs (Figure 2). Similar increases in landings, albeit not to the same magnitude, have occurred in many lobster stocks in the western Atlantic.

This fishery is managed by input controls including a minimum legal size (82.5 mm), prohibitions on landing of both egg-bearing and V-notched females, limited entry, a fixed season length (last Monday in November through to May 31st), and a trap limit. Other management measures include the requirement for escape vents to allow escapement of sublegal sizes and biodegradable trap mechanisms to mitigate ghost fishing by lost traps.

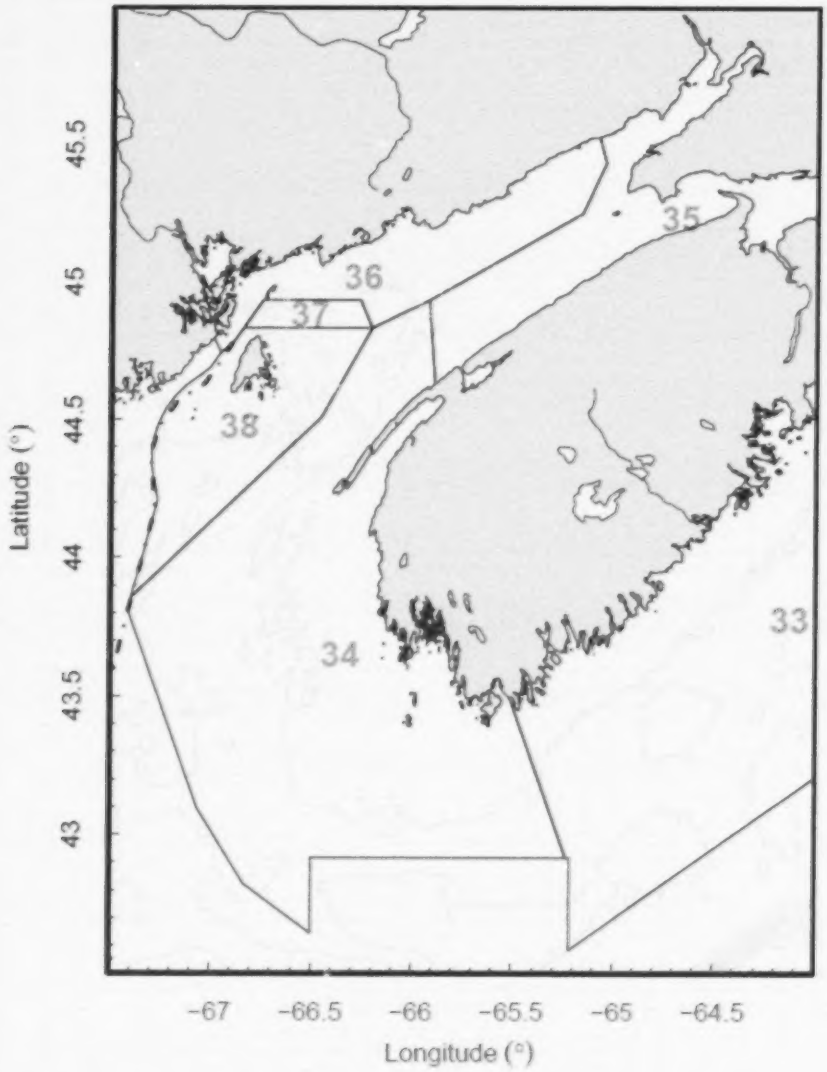

Figure 1. Spatial boundaries of Lobster Fishing Area (LFA) 34 and adjacent LFAs.

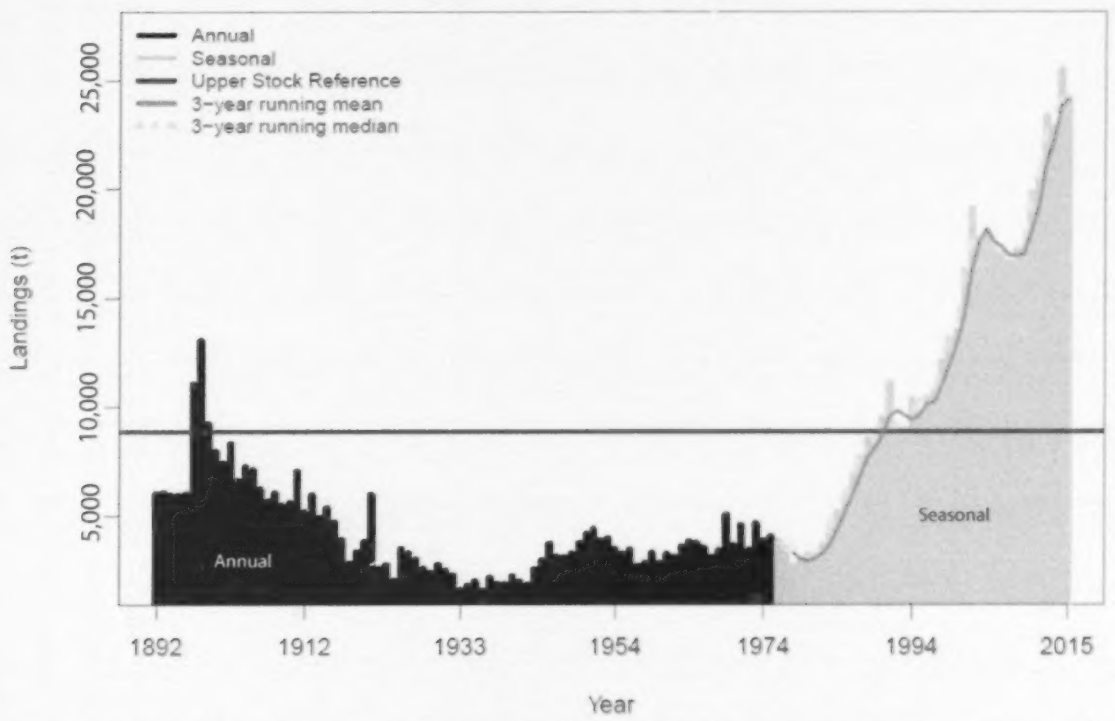

Figure 2. Annual lobster landings by the commercial fishery in LFA 34, 1892 to 1975 (black bars) and seasonal commercial landings (grey bars) from 1976 to 2015 (where 2015 represents the 2014-2015 season). The Upper Stock Reference defined as 80% of the median of landings in the period of 1985 to 2009 is shown as the horizontal blue line. The 3-year running mean of landings is shown as the solid red line. The 3-year running median is the dashed green line.

Analysis and Response

The 2013 LFA 34 assessment (DFO 2013, Tremblay et al. 2013) provided an analysis of stock health by describing fishery performance and providing indicators for abundance or biomass, fishing pressure and reproduction. Three primary indicators were identified and associated reference points were tabled. The first biomass indicator was based on landings. Landings-based reference points are part of the current Inshore Lobster Integrated Fishery Management Plan for LFAs 27-38 and were documented at a Maritimes Region Science Advisory Meeting in 2012 (DFO 2012). Using landings as the sole indicator of biomass for lobster stocks has risks, and one of the goals of the 2013 assessment (DFO 2013) was to provide potential alternatives. Two additional indicators and associated Upper Stock Reference points (USR) were proposed and have subsequently been adopted. The first was based on commercial catch rate calculated as total landings per total trap hauls in LFA 34. The second was based on the mean number of lobsters per tow in the fishery-independent Inshore Lobster Trawl Survey (herein ILTS; formerly known as the "ITQ" survey). For each indicator, a 3-year running mean of the index was used to compare to the USR. Additionally, a 3-year running median was shown as it is less sensitive to outliers. Currently, the 3-year running mean of each index is above the respective USR; thus, LFA 34 is considered to be in the healthy zone.

Landings

Landings for 2014-2015 were the second highest on record (Figure 2). The USR for the biomass of legal lobsters based on landings (8,867 t) was defined as 80% of the median for the period 1984-85 to 2008-09. For the season ending 2014-15, the 3-year running mean landings was 24,111 t, which was above the USR.

Commerical Catch Rate

The commercial catch-per-unit-effort (CPUE, in kg/trap haul) has increased substantially since 1999-2000, and the 2013-2014 and 2014-2015 values of 1.25 kg/trap haul were the highest on record. The USR for the biomass of legal size lobsters based on the CPUE (0.62 kg/trap haul) was defined as 80% of the median for the reference period 1998-1999 to 2008-2009. The current 3-year running mean is 1.23 kg/trap haul, which is above the USR (Figure 3).

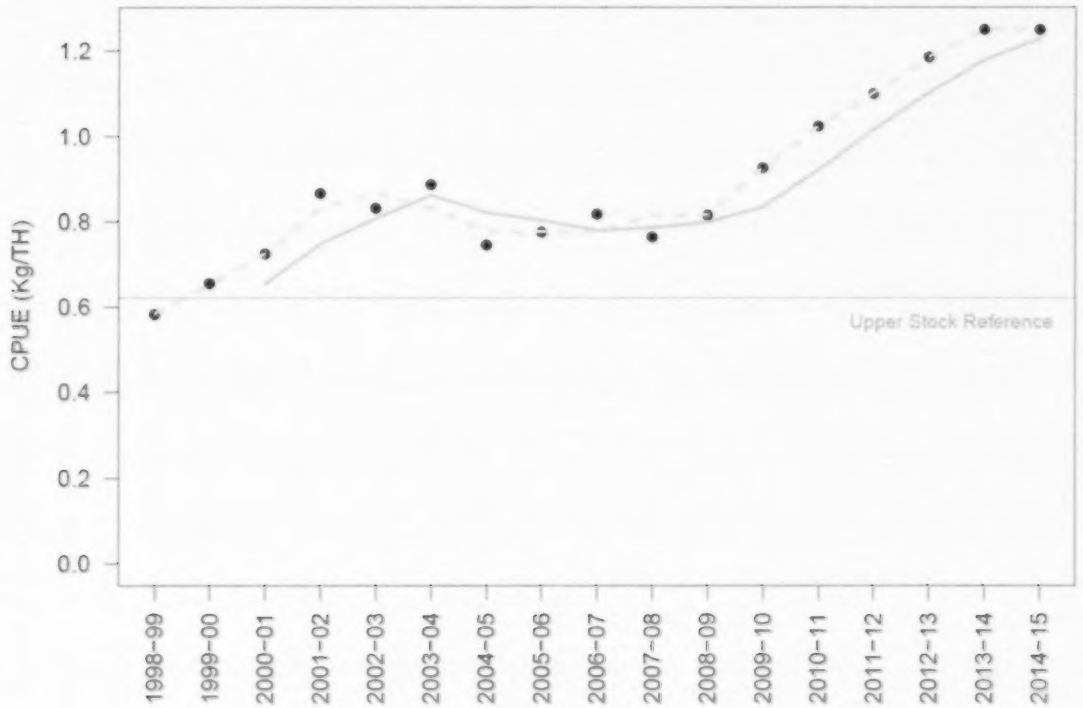

Figure 3. Trend in commercial CPUE (total weight landed (kg)/total trap hauls) for available time period together with the Upper Stock Reference (USR) (horizontal line at 0.62 kg/trap haul). The USR is based on 80% of the median CPUE from 1998-1999 to 2008-2009. The solid orange line is the 3-year running mean (1.23 after 2014-2015 season). The dashed green line is the 3-year running median.

Fishery-Independent Survey

The fishery independent indicator in the last assessment (DFO 2013) was based on the catch rate (number of lobsters/tow) from the ILTS. This survey was historically designed for other species but also sampled lobsters. The USR for total (legal and sublegal) lobster abundance based on this survey was 80% of the median catch rate for the period 1996-2009. Figure 4 shows that the 3-year running mean after the 2015 survey was above the USR and has been relatively stable for the past 4 years.

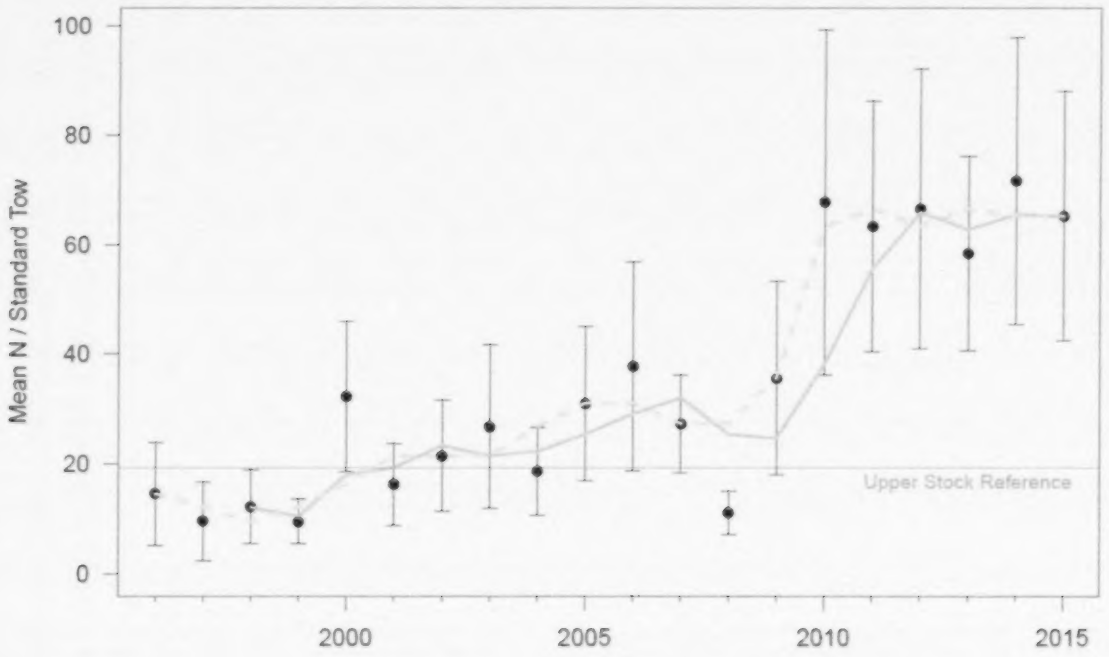

Figure 4. Trend in mean number of lobsters per standard tow from the ILTS (formerly ITQ) survey with a reduced number of stations (n=32) (DFO 2015) to adjust for changes to the survey in 2013. Standard error bars are shown for each year. An adjusted Upper Stock Reference (horizontal line at 19.3 lobsters/standard tow) was calculated by taking 80% of the median number per standard tow for the reduced number of stations. The solid orange line is the 3-year running mean. The dashed green line is the 3-year running median.

Conclusions

At the end of the 2014-2015 season (May 31, 2015), the lobster stock in LFA 34 was considered to be in the healthy zone based on three indicators (landings, commercial catch rate and trawl survey catch rate). The 3-year running mean of each indicator is above the respective USRs.

Each of the indicators has strengths and weaknesses that were outlined in the previous assessment (DFO 2013). Given that all three are providing similar signals, there is confidence that the stock abundance and biomass remains high relative to the 1985-2009 period.

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